UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,298	03/29/2001	Minoru Yamanaka	0828.65363	2115

7590 09/07/2005

Patrick G. Burns, Esq.
GREER, BURNS & CRAIN, LTD.
300 South Wacker Dr., Suite 2500
Chicago, IL 60606

EXAMINER	
HUYNH, CONG LAC T	

ART UNIT	PAPER NUMBER
2178	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/821,298	YAMANAKA ET AL.	
	Examiner	Art Unit	
	Cong-Lac Huynh	2178	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: RCE filed 6/27/05 to the application filed on 3/29/01.

2. Claims 1-2, 4-7 are pending in the case. Claims 1, 6, and 7 are independent claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-2, 4-7 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

Regarding independent claim 1, moving at least one second data item contained in the third page to the first page when the first page has sufficient available space and said second page has insufficient available space, is critical or essential to the practice of the invention, but is not enabled by the disclosure since the specification only shows moving the second data item from the third page to the second page, not to the first page (specification, page 5, line 26 to page 6, line 1). There is no case where the first page has sufficient available space and the second page has insufficient available space. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Independent claim 6 is rejected under the same issue.

Dependent claims 2-5, 7 are rejected for fully incorporating the deficiencies of their base claims 1 and 6 respectively.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-3, 5-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claim 1, the feature "moving at least one data item to the first or the second page..." (lines 11-12) is confusing since said moving is clarified that the "second data item is moved to the first page" (lines 15-17) only. It appears that the "or the second page" in step (c) is not necessary. However, as mentioned above, said claimed limitation is not disclosed in the specification of the invention.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-2, 4-7 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamigawa (US Pat No. 5,307,486, 4/26/94) in view of Culik, II, Dense Multiway Trees, ACM Transactions on Database Systems, vol.6, no.3, September 1981, pages 486-512.

Regarding independent claim 1, Nakamigawa discloses:

- storing information on an amount of available space in each of said plurality of nodes (**figures 2-3**: the pointer count in each node is the information indirectly showing the amount of space available in each node, for example, the pointer count in the node in figure 3 indicates that there are only three records A, B, C in the node and so said node has available space for two more records)
- acquiring an amount of available space in the first node and the second node based on said information stored in step (a), when a first data item is inserted into or deleted from the target node, said plurality of pages include the first node and the second node in a sequential arrangement of the plurality of nodes (**figure 4**: the pointer count (see fig. 2) in the target node with records A, C, D, E, F shows there is *zero available space* for inserting a record to the target node, the pointer count in the adjacent node with records G, H, I shows there are available space for two records; **col 3, lines 39-49, col 4, lines 15-28**:

determining if the pointer count of a target node after insertion is greater than M and determining if the pointer count of an adjacent node is less than M' imply that the amount of available space of the first node and the second node is acquired based on the pointer count data)

- moving at least one second data item contained in said first node to said second node according to said amount of available space in each of said first and second nodes, before insertion of said first data item into said first node or after deletion of said first data item from said third page (**figure 4**: record F, equivalent to the second data item, is moved from the target node to the adjacent node, which is equivalent to the second node, since the adjacent node has some space available whereas the target node does not have any available space for inserting record B, which is equivalent to the first data item)
- wherein in the moving step, when said first pages has sufficient available space, and said second page has insufficient available space, said at least one second data item is moved to said first page (**figure 4**: item F, which is considered equivalent to the second data item, is moved to the node (GHI), which has sufficient available space whereas node (ACDEF) has insufficient available space if inserting item B, which is equivalent to the first data item, to the node (ACDEF) is needed to be carried out)

Nakamigawa does not disclose a method of data item managing as above is applied to a plurality of data items contained in a plurality of pages. Instead, Nakamigawa

discloses a method *of data item managing for a plurality of data items contained in a plurality of nodes* (figures 2-5).

Culik discloses that each node in a B-tree corresponds to a page where insertion or deletion can be applied to the B-tree (pages 486-487), each node has the left and right brothers (page 487), and a node can be created (page 492).

It would have been obvious to an ordinary skill in the art at the time of the invention was made to have incorporate Culik into Nakamigawa to show that managing of data items in the nodes in Nakamigawa can be applied to managing the data items in the pages, arranged in sequence in a document where the pages are equivalent to the nodes.

Nakamigawa also does not disclose the third page for inserting or deleting data items. However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have combined Culik into Nakamigawa to include a first page (or first node) for managing the data item in the sequential pages for the following reason. In Nakamigawa, two nodes are mentioned: the target node and the adjacent node. The first data item is inserted into or deleted from the target node (equivalent to the third node of the invention) and the second data item is moved from the target node to the adjacent node (equivalent to the second node of the invention).

The claimed limitations, in a slightly difference, recite three pages, equivalent to three nodes, in which the first page, the third page, and the second page arranged in such a sequence where the insertion or deletion of the first data item occurs in the third page, and where the moving of the second data item contained in the third page to either the first page or the second page. It is easy to recognize that the target node of

Nakamigawa is equivalent to the third node, and that *the adjacent node of Nakamigawa is equivalent to either the first page or the second page of the claim* since the adjacent node is the one that the second data item is moved to. Also, it was obvious that the "adjacent node" of the target node means that the "adjacent node" can precede or follows the target node *provided that it is adjacent to the target node*. Further, as in Culik, each node may have the left brother and the right brother, and it is possible to create a leaf node. Therefore, it is suggested adding a node equivalent to the first node to the sequence of the target node and the adjacent node since *the node added is merely a form of adjacent node* and for performing the same function as that of the first node or the second node of the invention.

Regarding claim 2, which is dependent on claim 1, Nakamigawa discloses that when said amount of said available space is equal to or less than a predetermined amount, said information indicates that substantially no available space exists (col 1, lines 25-45, col 2, lines 39-50, figures 2-4). As disclosed, ***the pointer count increases 1** when a record is inserted in a node* (figures 2-3: the pointer count of the node in fig. 3 increases 1 when record B is inserted in said node). For a maximum size M of the records in one of the nodes, moving a number of records from the target node to the adjacent node happens if (a pointer count of a target node **after insertion) > M**, and (a pointer count of the adjacent node) < M (col 1, lines 25-45). The pointer count of a target node after insertion is greater than M where M represents the size of the target node (col 2, lines 39-50) *means that before the insertion a record, the pointer count of the target node*

must be equal to the amount M. The moving a data item in the target node to the adjacent node occurs since either there is **not enough** space for inserting data in the target node or there is **no** available space in the target node for inserting data. In other words, the *information relating to the node size indicates that substantially no space available exists*.

Regarding claim 4, which is dependent on claim 1, Nakamigawa discloses that said amount of the available space is classified into one of a plurality of ranges of amounts of the available space, and said information on the amount of the available space indicates one of the plurality of ranges (col 2, lines 39-50 and col 1, lines 25-62). As disclosed in Nakamigawa, the maximum size M is for storing the records in one of the nodes and size M' smaller than M is for storing the records in an adjacent node thereto, and an insert process of the records to one of the nodes is performed based on the sizes M and M' via checking the pointer count of the target node and the pointer count of the adjacent node for available space. The minimum size m is for storing the records in one of the nodes and size m' larger than m for storing the records in an adjacent node thereto, and a delete process of the records from one of the nodes is carried out based on the sizes of m and m' via checking the pointer count of the target node and the pointer count of the adjacent node for available space. The ranges of (M', M) and (m, m') are classified for available space for the insertion process and the deletion process. Therefore, the information of pointer count for deriving the available space in one of the

nodes indicates one of the plurality of ranges, either the range for insertion or the range for deletion.

Regarding claim 5, which is dependent on claim 1, Nakamigawa discloses that one of the plurality of ranges including the biggest amount of the available space is wider than the other of said plurality of ranges (col 2, lines 39-50: the range (M', M) includes the maximum size M for storing records in one of the nodes where M is used for checking the available space of the target node and where range (M', M) is wider than range (m, m').

Claims 6 and 7 are for a computer-readable storage medium and an apparatus of method claim 1, and are rejected under the same rationale.

Response to Arguments

10. Applicant's arguments filed 6/27/05 have been fully considered but they are not persuasive.

Applicants argue that Nakamigawa fails to disclose or suggest inserting data to a page or node that precedes a target node (Remarks, page 6).

Examiner agrees that inserting data to a page or node that precedes a target node is not disclosed in Nakamigawa. However, Nakamigawa does teach inserting data to a page or node that follows a target node (figure 4: item F of node (ACDEF) is inserted to the node (GHI)). Since it does not make any difference that the node which receives

the inserted data precedes or follows the target node as long as the condition that the node receiving the inserted data has sufficient available space, and the target node has insufficient available space is satisfied. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have modified Nakamigawa to switch the node receiving the data item to precede the target node instead of following the target node.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Iivonen (US Pat No. 6,374,339 B2, 4/16/02, filed 3/2/01, priority 8/27/99).

Yazdani et al. (US Pat No. 6,859,455 B1, 2/22/05, filed 11/10/00, priority 12/29/99).

Wang (US Pat No. 5,825,944, 10/20/98, filed 4/10/97).

Oyanagi et al. (US Pat No. 6,662,189 B2, 12/9/03, filed 3/13/01).

Kothuri et al. (US Pat No. 6,470,344 B1, 10/22/02, filed 8/27/99, priority 5/29/99).

Chawathe et al., Meaningful Change Detection in Structured Data, ACM 1997, pages 26-37.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cong-Lac Huynh whose telephone number is 571-272-4125. The examiner can normally be reached on Mon-Fri (8:30-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Hong can be reached on 571-272-4124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cong-Lac Huynh
Examiner
Art Unit 2178
08/30/05